

SECTION 6

6.05 PIPE FITTINGS:

- A. Joints: Joints and fittings shall conform to the applicable AWWA Standards, and shall bear at least the pressure rating of the straight pipe involved. Acceptable joint types for straight lengths of pipe are push on and mechanical. Mechanical joints for straight lengths of pipe will be allowed only under specific situations receiving approval of Denver Water.

Within the City and County of Denver and Total Service Contract Areas, all fittings shall be furnished with mechanical joint ends and shall conform to MS-3. Private pipe extensions shall use mechanical joint or push-on joint fittings and otherwise shall conform to MS-3. Exception: Fire hydrant tees shall be mechanical joint ends. Flanged joints are permitted where specified in the Materials Specifications.

The use of wyes is strictly prohibited.

- B. Closure Fittings: Bolted Sleeve Type Couplings in accordance with AWWA C219 shall be of a gasketed, sleeve-type, with diameter to properly fit the pipe. Tolerance on pipe and coupling, together with proper bolt and gasket arrangements, shall be sufficient to insure permanent watertight joints under all conditions. Couplings shall be sufficiently wide, so that each type of pipe joined will have as much pipe end inserted in the couplings as is provided by the standard push on or mechanical joint for the pipe size and type involved.

The following table contains the minimum center sleeve dimensions for "bolted sleeve" type couplings:

<u>Pipe Diameter (Inches)</u>	<u>Center Sleeve Thickness (Inches)</u>	<u>Center Sleeve Width (Inches)</u>
4	0.250	5
6	0.250	5
8	0.250	5
12	0.375	7
16	0.375	7
20	0.375	7
24	0.375	7

Cast or ductile iron sleeves shall have mechanical joints of the proper size and tolerance to assure a water tight fit.

"Long bell" closure pieces shall be of at least equal strength to the straight pipe being joined and shall contain push on joints of the proper tolerance to insure watertight connections.

"Compression" fittings for small diameter pipe (less than 3 inch diameter) may be utilized for connection or repair only with approval of Denver Water.

Where pipes of different types are connected together, or where pipe is connected to fittings or valves of different materials, great care shall be taken to insure that the proper ring, insulating gasket, or adapter is selected.

- C. Miscellaneous Pipe Fittings: Flanged adapters, plugs, end caps, bulkheads, cut-in sleeves, anchor couplings, repair fittings, and other appurtenances shall be used where appropriate throughout the system, subject to the approval of Denver Water. Denver Water does not intend to limit unreasonably, the installation of any type of fitting, joint, or proprietary device, however, the installation of any such fitting, not specifically approved by these Standards, is subject to the approval of Denver Water. Written request for approval of deviating items shall be made in advance through Denver Water.
- D. Clamps, Rods and Joint Restraint Devices: Harnessing of joints may be accomplished either by use of the clamp and rod system shown on Sheets 20 through 25 of the Standard Drawings, or by use of one of the mechanical joint restraint systems as shown on Sheet 26 or 27 on the Standard Drawings, and specified in MS-27, or by use of one of the several proprietary joint restraint systems supplied by pipe manufacturers. The proprietary systems will require approval of Denver Water prior to use. Regardless of the system used, restrained lengths of pipe for various fittings, where harnessing is utilized or required, shall be at least equal to the lengths shown on Sheet 20 of the Standard Drawings. Details and materials of clamps, rods and nuts, washers, rod couplings, and flange lugs used by Denver Water are shown on the Standard Drawings.

Where joint restraint is required on PVC pipe, the designer may use a joint restraint system of the type supplied by pipe manufacturers and approved by Denver Water or switch to a metallic pipe and use rods and clamps. The use of rods and clamps on PVC pipe is not allowed unless specific approval is granted by Denver Water.